UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/543,284	04/05/2000	Boris Dmitrievich Lubachevsky	Lubachevsky-10-2	6481

7590   03/10/2004

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EXAMINER
STEVENS, THOMAS H

ART UNIT	PAPER NUMBER
2123	2

DATE MAILED: 03/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/543,284	LUBACHEVSKY ET AL.
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _05 April 2000_.
2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-20_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) _1-20_ is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on _01 April 1950_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
        1.☐ Certified copies of the priority documents have been received.
        2.☐ Certified copies of the priority documents have been received in Application No. _____.
        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _4/08/00_.
4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

U.S. Patent and Trademark Office
PTOL-326 (Rev. 1-04)   Office Action Summary   Part of Paper No./Mail Date 3

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2.   Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The notation "e" in $e \log_e N$ is not properly defined such that the examiner is unsure whether the applicants' notations is exponential, event or a combination of the two.

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4.   Regarding claim 2, the phrase "on or more iterations" renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

5.   Furthermore, claims 7,8 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention:

- ❑ Claim 7: "carried out when said step of determining, carried..." – vague.

- ❑ Claim 8: " when said step of determining, carried..."-vague.

- ❑ Claim 13: Limitation is unclear.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7.   Claims 1-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to an algorithm .The examiner respectfully submits that the applicants have not claimed a practical application. An invention which is eligible for patenting under 35 U.S.C. § 101 is in the "useful arts" when it is a machine, manufacture, process or composition of matter, which produces a concrete, tangible, and useful result. The fundamental test for patent eligibility is thus to determine whether the claimed invention produces a "useful, concrete and tangible result.

The examiner respectfully submits, under current PTO practice, that the claimed invention does not recite a tangible or concrete result. The claims are not tangible because they appear to recite a mathematical algorithm namely the discrete element parallel simulation is confined or limited space that doesn't have specific preprocessing or post solution activity.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9.   Claims 1-20 are rejected under 35 U.S.C. 102(b) as being anticipated by

Lubachevsky et al (Paper: 1993). Lubachevsky et al. teaches a general model of

synchronous relaxation for parallel simulations with applications to circuit-switched

networks (abstract).

Claim 1: A method for simulating events comprising the steps of: assigning events to be

simulated to each of N processing (pg. 291, lines 5-9) elements (PEs) (pg. 312, lines 1-

7;and 289, lines 20-25); and said N PEs simulating events in parallel, in a simulation

step where each processing element (PE) simulates assigned events in blocks of M

edge events, where M is approximately a $\log_e N$, and an edge event is an event (pg.

293, 7-14) whose simulation in a processing element is directly affected by information

originating in another processing element (pg. 289, lines 1-8).

Claim 2: The method of claim 1 where each of said simulation steps comprises one or

more iterations (pg 294, figures 2 and 3;pg. 295, lines 15-17).

Claim 3: The method of claim 2 where each iteration comprises a simulation phase followed by a communication phase (pg. 299, Gauss-Sidel section) and an assessment phase (pg. 299, computational experience, lines 4-7).

Claim 4: The method of claim 3 where, in each communication phase (pg. 299, Gauss-Sidel section), each of said PEs shares information with one or more other PEs from said N PEs, which information is needed by said other PEs to simulate edge events of said other PEs.

Claim 5: The method of claim 4 where said information shared by each PE in a communication phase of an iteration is related to events simulated by said each PE in said iteration (pg. 294, figures 2-3).

Claim 6: The method of claim 4 where said assessment phase carried out by each of said PEs comprises the steps of determining whether the existence of a simulation error can be excluded (pg. 302, data flow analysis section, lines 7-13) and directing that another simulation iteration is to take place when the existence of a simulation error cannot be excluded.

Claim 7: The method of claim 6 further comprising a floor advancement step, carried out when said step of determining, carried out in all of said PEs, excludes existence of a simulation error in a simulation iteration, that advances a simulation floor time of a present simulation step to form a modified simulation time floor, for simulating another block of M events in a next simulation step (pg. 299, lines 9-15).

Claim 8: The method of claim 6 further comprising a step of advancing a simulation floor time from a simulation floor time of a present simulation step, to form a modified simulation floor time (pg. 299, lines 9-15), for starting from said modified simulation floor time the simulation of another block of M events in a next simulation step, when said step of determining, carried out in all of said PEs, excludes the existence of a simulation error in said present simulation step.

Claim 9: The method of claim 8 where said modified simulation floor time corresponds (pg. 299, lines 9-15), to the earliest simulation time of the Mth edge event simulated by said N PEs in said present simulation step (pg. 289, lines 8-12).

Claim 10: The method of claim 4 where events are simulated seriatim in each simulation phase (pg. 289, lines 13-25).

Claim 11: The method of claim 10 where for simulating a second event following a simulation of a first event, a time interval (pg. 293, lines 7-8) is identified between a simulation time of said first event and a simulation time of said second event, and said second event is identified for simulation.

Claim 12: The method of claim 11 where said second event is identified for simulation following a step of accounting for simulation of said first event and simulation of events in said other PEs from said N PEs (pg. 295, second paragraph).

Claim 13: The method of claim 12 where said accounting is based on present

knowledge of states of said other events (title, introduction).

Claim14: The method of claim 12 where said accounts for simulation of events in said

other PEs from said N PEs accounts for events simulated during said time interval

(figures 2 and 3).

Claim15: The method of claim 11 where said second event is identified by employing a

first random number (pg.288, last two sentences).

Claim16: The method of claim 11 where said time interval is identified with a second

random number (pg.288, last two sentences).

Claim 17: The method of claim 16 where said second random number is set to said first

random number (pg.288, last two sentences).

Claim 18: The method of claim 15 where said first random number is derived from a

random variable having a uniform distribution (pg. 309, lines 1-6).

Claim 19: The method of claim 15 where the seriatim simulation of each event in said

block of M events, in a first iteration starting from a given simulation floor time, employs

an independently derived random number from said random variable, forming thereby a

sequence of random numbers (pg. 305-306, sections 6.0-6.1), and simulation of said

block of M events in all subsequent iterations starting from said given simulation floor

(pg. 299, lines 9-15) time employs said sequence of random numbers.

Claim 20: The method of claim 18 where the sequence of random numbers employed

in one simulation step is different from a sequence of random numbers employed in

another simulation step (pg. 305-306, sections 6.0-6.1),
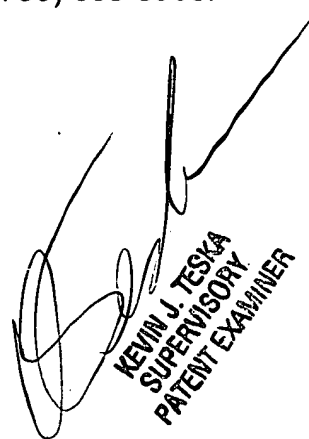

Correspondence Information

10.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Tom Stevens whose telephone number is (703) 305-

0365, Monday-Friday (8:30 am- 5:30 pm) or contact Supervisor Mr. Kevin Teska at

(703) 305-9704. The fax number for the group is 703-872-9306.

        Any inquires of general nature or relating to the status of this application should

be directed to the Group receptionist whose phone number is (703) 305-3900.

March 4, 2004

THS